

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Nebraska Agricultural Experiment Station

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *seventeen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS SEED OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS PROVIDED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT

'Agate'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington this 20th day of April in the year of our Lord one thousand nine hundred and seventy-eight

Attest:

[Signature]
Acting
Commissioner
Plant Variety Protection
Grain Division
Agricultural Marketing Service

[Signature]
Secretary of Agriculture



APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: See Reverse.

1a. TEMPORARY DESIGNATION OF VARIETY NE69442	1b. VARIETY NAME Agate	FOR OFFICIAL USE ONLY PV NUMBER 7700093	
2. KIND NAME Hard Red Winter Wheat	3. GENUS AND SPECIES NAME <u>Triticum aestivum</u> L.	FILING DATE 6-10-77	TIME 3:15 A.M. P.M.
4. FAMILY NAME (BOTANICAL) Gramineae	5. DATE OF DETERMINATION July 1969	FEE RECEIVED \$ 250.00 \$ 250.00 \$ 250.00	DATE 6-10-77 6-10-77 3-30-78
6. NAME OF APPLICANT(S) Board of Regents University of Nebraska Agricultural Research Service U.S. Department of Agriculture	7. ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code) Lincoln, Nebraska 68583 Washington, D.C. 20250	8. TELEPHONE AREA CODE AND NUMBER 402-472-2811 202-447-3656	
9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: (Corporation, partnership, association, etc.) Corporation and U.S. Government Agency	10. IF INCORPORATED, GIVE STATE AND DATE OF INCORPORATION Nebraska and Washington	11. DATE OF INCORPORATION	
12. Name and mailing address of applicant representative(s), if any, to serve in this application and receive all papers: Dr. Howard W. Ottoson, Director Agricultural Experiment Station University of Nebraska Lincoln, NE 68583 Dr. T. W. Edminister Office of Administration Agricultural Research Service-USDA Washington, DC 20250			

13. CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:

- ☒ 13A. Exhibit A, Origin and Breeding History of the Variety (See Section 52 of the Plant Variety Protection Act.)
- ☒ 13B. Exhibit B, Novelty Statement.
- ☒ 13C. Exhibit C, Objective Description of the Variety (Request form from Plant Variety Protection Office.)
- ☒ 13D. Exhibit D, Additional Description of the Variety.

14A. Does the applicant(s) specify that seed of this variety be sold by variety name only as a class of certified seed?
(See Section 83(a). (If "Yes," answer 14B and 14C below.) ☒ YES ☐ NO

14B. Does the applicant(s) specify that this variety be limited as to number of generations?

☒ YES ☐ NO

14C. If "Yes," to 14B, how many generations of production beyond breeder seed?

☒ FOUNDATION☒ REGISTERED☒ CERTIFIED

15. Does the applicant(s) agree to the publication of his/her (their) name(s) and address in the Official Journal?

☒ YES ☐ NO

16. The applicant(s) declare(s) that a viable sample of basic seed of this variety will be deposited upon request before issuance of a certificate and will be replenished periodically in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

MAY 13 1977

(DATE)

4/9/77

(DATE)


(SIGNATURE OF APPLICANT)
(SIGNATURE OF APPLICANT)

INSTRUCTIONS

GENERAL: Send an original copy of the application, exhibits and \$250.00 fee to U.S. Dept. of Agriculture, Agricultural Marketing Service, Grain Division, National Agricultural Library, Beltsville, Maryland 20705. (See Section 180.175 of the regulations and rules of practice.) Retain one copy for your files. All items on the face of the form are self-explanatory unless noted below.

ITEM

- 5 Give the date the applicant determined that he had a new variety based on (1) the definition in Section 41(a) of the Act and (2) the date a decision was made to increase the seed.
- 13a Give (1), the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method. (2), the details of subsequent stages of selection and multiplication. (3), the type and frequency of variants during reproduction and multiplication and state how these variants may be identified and (4), evidence of stability.
- 13b Give a summary statement of the variety's novelty. Clearly state how this novel variety may be distinguished from all other varieties in the same crop. If the new variety most closely resembles one or a group of related varieties; (1) identify these varieties and state all differences objectively; (2) Attach statistical data for characters expressed numerically and demonstrate that these differences are significant; and (3) submit, if helpful, seed and plant specimens or photographs of seed and plant comparisons clearly indicating novelty.
- 13c Fill in the Exhibit C, Objective Description form for all characteristics, for which you have adequate data.
- 13d Describe any additional characteristics that are not described, or whose description cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the description of characteristics that are difficult to describe; such as; plant habit, plant color, disease resistance, etc.

"YES" is specified (seed of this variety be sold by variety name only as a class of certified seed) the applicant may NOT reverse his affirmative decision after the variety has either been sold and so labeled or published or the certificate has been issued. However, if the applicant specifies "NO", he may change his choice. (See Section 180.15 of the Regulations and Rules of Practice.)

JUN 10 1977

EXHIBIT A

ORIGIN AND BREEDING HISTORY OF AGATE

PEDIGREE: Ponca/3*Cheyenne/2/Kenya 58/Newthatch/2/2*(Cheyenne/Tenmarq/Mediterranean/Hope)/3/Scout.

DATE OF CROSS: Cross 62224, 1962

PLACE: Agronomy Department, Nebraska Agricultural Experiment Station, Lincoln, Nebraska.

The breeding history of Agate is summarized in Table 1. The decision to release Ponca/3*Cheyenne/2/Kenya 58/Newthatch/2/2*(Cheyenne/Tenmarq/Mediterranean/Hope)/3/Scout, Nebr. Sel. 69442 (C.I. 17463), under the name of Agate was made on December 15, 1975 by the Nebraska Agricultural Experiment Station. Public release of information on Agate as a variety occurred on June 15, 1976*. The North Central Region, Agricultural Research Service, U.S. Department of Agriculture, joined the Nebraska Agricultural Experiment Station in the release of Agate.

Breeder seed of NE69442 was seeded in the fall of 1974. From this the Nebraska Foundation Seed Division produced 60 bushels of breeder seed and 297 bushels of foundation seed. In 1976, the Foundation Seed Division produced an additional 416 bushels from breeder seed planted in the fall of 1975. The foundation seed from both crop years was allocated to Nebraska growers in 1976 for production of registered seed in 1977. Breeder seed was supplied to other states and seeded in 1976 for further production of foundation seed in 1977.

Agate appears to be very stable genetically. The only variant observed during the testing period is an occasional red- or bronzed-chaffed plant. The frequency is extremely low, much less than 1 in 10,000.

* Release statements attached.

Table 1. Breeding history of Agate hard red winter wheat.

<u>Year</u>	<u>Generation</u>	<u>Nursery</u>	<u>Disposition</u>
1962	F ₀	Cross 62224 made in the greenhouse at Lincoln, NE	Seeded in the fall of 1962 at Lincoln, NE
1963	F ₁	Grown in the field at Lincoln, NE. Row 2504.	Advanced to F ₂ nursery.
1964	F ₂	F ₂ bulk hybrid, plot 1004, Lincoln, NE.	Harvested in bulk and advanced to F ₃ bulk hybrid nursery.
1965	F ₃	F ₃ bulk hybrid, plot 1004, Lincoln, NE.	Harvested in bulk and advanced to F ₄ bulk hybrid nursery.
1966	F ₄	F ₄ bulk hybrid, plot 1004, Lincoln, NE.	250 heads selected and advanced to Lincoln head-row nursery.
1967	F ₅	Head-row nursery, row 9449.	Row harvested in bulk and advanced to preliminary observation nursery.
1968	F ₆	Preliminary Observation, plot 2206.	Advanced to duplicated observation plots.
1969	F ₇	Duplicated observation plots, number 442.	Plot 442 recognized as having merit; harvested and assigned Nebr. Sel. No. 69442. Advanced to Yield Trial.
1970	F ₈	Triplicate Yield Nursery.	Advanced to Nebr. Intrastate Nursery.
1971	F ₉	Nebraska Intrastate Yield Nursery	Continued in this nursery. Entered in Northern Regional Performance Nursery.
1972	F ₁₀	Nebraska Intrastate, Northern Regional Performance Nursery, Outstate Tests, Winterhardiness and other nurseries.	Continued in these tests.
1973	F ₁₁	Continued in above tests.	Continued in tests.
1974	F ₁₂	Continued in above tests. Preliminary collaborative milling and baking tests.	Continued in tests, Breeder seed increase.

Table 1. Concluded.

<u>Year</u>	<u>Generation</u>	<u>Nursery</u>	<u>Disposition</u>
1975	F ₁₃	Continued in tests. Large scale milling and baking evaluation.	Continued in tests. Large scale seed increase.
1976	F ₁₄	Released as Agate.	Foundation Seed to registered growers.

EXHIBIT B

DATA INDICATIVE OF NOVELTY OF AGATE

The Agate variety has been described as a late maturing Scout type and in field appearance resembles Scout 66. However, it differs markedly from Scout 66 in maturity and beak length. Scout 66 is moderately early in maturity and the glumes have short beaks. Agate is moderately late in maturity (similar to Warrior) and has long-beaked glumes.

Agate can be described as:

- a. An awned, moderately late maturing, white chaffed, hard red winter wheat. (Agronomic data in Tables 2, 3, and 7).
- b. A long-beaked variety.
- c. Moderately resistant to resistant to current stem rust races (has SR6, SR17 and other non-identified genes). (Tables 4 & 5).
- d. Susceptible to leaf rust.
- e. Moderately resistant to the Great Plains strain of Hessian fly (similar to Buckskin).
- f. Intermediate or below average in Septoria leaf blotch infection. (Table 3).
- g. Medium in dough handling properties (Table 6, Figure 1).
- h. A heavy kernel weight and large kernel size variety (Table 8) similar to Scout 66.

Agate can be distinguished from all other tall hard red winter wheats as follows:

1. From Centurk by having much heavier and much larger kernel size.
2. From HiPlains and Buckskin (also long-beaked varieties with some Hessian fly resistance) by seedling reaction to stem rust races 15B-2 and 56 (see below).
3. From the "Scout group" Larned (a Ottawa/5*Scout line released by Kansas), Sage, Cloud, Osage, Gent, Rall, Eagle, Baca and Scout 66 by beak length (Agate is long beaked all of the above are short beaked) and by seedling reaction to stem rust races 15B-2 and 56 (see below). Scoutland will also have the stem rust reactions of the Scout group but have somewhat longer beaks.
4. From the semidwarf varieties of Lindon and Vona by plant height and kernel weight. Agate is tall and has much heavier kernels than Lindon and Vona.
5. From Bronze by chaff color. Bronze has bronze or red chaff, Agate has white.

6. From Lancota by field reaction to leaf rust (Lancota is moderately resistant, Agate is susceptible).
7. From Lancer and Warrior by kernel weight, beak length and seedling reaction to stem rust races 15B-2 and 56 (see below). Agate has long beaks, large heavy kernels and has resistance to stem rust races 15B-2 and 56. Warrior will be susceptible to both races, Lancer will be susceptible to 15B-2 and heterogeneous to race 56. Both have much smaller seed as compared to Agate. Warrior is very short beaked, Lancer has intermediate beak length.
8. Overall Agate is similar to Scout 66 but it is later in maturity, has long beaks to relatively short beaks in Scout 66 and has seedling resistance to stem rust races 15B-2 and 56 (SR₆ gene) that Scout 66 does not have.

Agate will have a 0: reaction to stem rust races 15B-2 and 56; Vona and Centurk will have similar reactions but have small seed; Homestead and Sentinel will have similar reactions but will have moderately short beaks; Lindon will be heterogeneous for reaction while all of the others will have a 2 or higher seedling rating.

OCT 31 1977

FORM APPROVED. OMB NO. 40-R3712

FORM GR-470-6
(10-16-72)UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY

INSTRUCTIONS: See Reverse.

WHEAT (TRITICUM SPP.)

NAME OF APPLICANT(S) Board of Regents, University of Nebraska and Agricultural Research Service, U.S. Dept. of Agric. ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code) Lincoln, NE 68583 -- Washington, DC 20250	FOR OFFICIAL USE ONLY
	PVPO NUMBER
	VARIETY NAME OR TEMPORARY DESIGNATION Agate

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g., or) when number is either 99 or less or 9 or less.

1. KIND:

1 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

2. TYPE:

1 = SPRING 2 = WINTER 3 = OTHER (Specify) 1 = SOFT 3 = OTHER (Specify)

2 = HARD
2 1 = WHITE 2 = RED 3 = OTHER (Specify)

3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:

FIRST FLOWERING LAST FLOWERING

4. MATURITY (50% Flowering):

NO. OF DAYS EARLIER THAN 1 = ARTHUR 2 = SCOUT 3 = CHRIS
 4 NO. OF DAYS LATER THAN 4 = LEMHI 5 = NUGAINES 6 = LEEDS

5. PLANT HEIGHT (From soil level to top of head):

CM. HIGH (1976 Nebr. Outstate Tests) Other years shorter but equal to Scout 66.

0 CM. TALLER THAN 2 1 = ARTHUR 2 = SCOUT 3 = CHRIS

0 CM. SHORTER THAN 2 4 = LEMHI 5 = NUGAINES 6 = LEEDS

6. PLANT COLOR AT BOOTING (See reverse):

3 1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTER COLOR:

1 1 = YELLOW 2 = PURPLE

8. STEM:

1 Anthocyanin: 1 = ABSENT 2 = PRESENT

1 Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT

0 5 NO. OF NODES (Originating from node above ground)

2 Waxy bloom: 1 = ABSENT 2 = PRESENT

1 Internodes: 1 = HOLLOW 2 = SOLID

4 2 CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW (compared to 48 for Scout 66)

9. AURICLES:

1 Anthocyanin: 1 = ABSENT 2 = PRESENT

1 Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:

2 Flag leaf at booting stage: 1 = ERECT 2 = RECURVED
3 = OTHER (Specify):

1 Flag leaf: 1 = NOT TWISTED 2 = TWISTED

1 Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT

2 Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT

0 9 MM. LEAF WIDTH (First leaf below flag leaf)

3 1 CM. LEAF LENGTH (First leaf below flag leaf): 7

EXHIBIT C

Table 7. Comparative data for Scout 66, Lancer and Agate grown at Mead, NE, 1976. Average of 50 measurements.

Trait		Scout 66	Lancer	Agate
Head length: cm.	Mean	8.91	7.14	8.80
	Range	(6.5-10)	(4.5-9)	(6-12)
Head width: mm.	Mean	9.04	8.76	8.60
	Range	(8-11)	(7-10)	(7-10)
Awn length: cm.	Mean	6.07	6.23	5.55
	Range	(4-8)	(4-10)	(4-7)
Glume length: mm.	Mean	7.49	7.13	7.51
	Range	(6-8.5)	(6.5-8)	(6-9)
Glume width: mm.	Mean	3.29	2.96	3.26
	Range	(2-4.5)	(2-3.5)	(3-4)
Beak length: mm.	Mean	3.44	4.88	6.44
	Range	(2-7)	(2-8)	(4-13)

Table 8. Comparative kernel data for three winter wheats grown in Nebraska in 1976 and kernel weight data for the period 1973-76.

Trait	Scout 66	Lancer	Agate
Kernel length, mm. (7 location average)	6.42	6.02	6.56
Kernel width, mm. (7 location average)	2.55	2.36	2.47
1000-kernel wt., grams (12 locations, 1976)	29.5	24.1	29.10
1000-kernel wt. grams (1973-1976 average)	30.8	26.3	31.0

7700093

EXHIBIT D

BOTANICAL DESCRIPTION OF AGATE

The botanical description of Agate is as follows: plant winter habit, medium-late maturity; height mid-tall; blue-green foliage, waxy bloom, leaves medium in width; stem white to yellow, mid-strong; spike awned, oblong to tapering; mid-dense, carried erect; glumes glabrous, white to yellow, medium long and medium wide, with rather narrow mostly square shoulders; beaks moderately long and acuminate; awns white, 4-7 cm. long; kernels red, medium hard, elliptical, moderately long and large with moderately heavy 1000-kernel weight; germ mid-sized; crease shallow, cheeks rounded; brush short, not collared.

Table 2.--Summary of agronomic data for the 16 lines grown in the Northern Regional Performance Nursery in 1975.

Entry: no.:	Variety or Pedigree	: C. I. or : Days to : Sel. No. : head	: Days to : ripe	: Plant : Winter : Lodging : Height: Survival:
		:from 1/1	: from 1/1	: cm. : 0-9 : 0-9
Number of trials				
14	II21031/Trapper//C0652363	12	1	14 3 6
2	Warrior	159	207	79 9 2
6	Agate	160	205	91 9 3
8	Warrior/Scout	161	204	92 9 3
4	Atl66/Cnn//Lancer	159	204	92 9 3
10	SS/D8/Wmt/4/Hume/3/SS/12500/RCh/Pn//Cnn	159	206	91 9 2
7	Warrior/Scout	159	208	80 9 2
3	Atl66/Cnn//Cnn/Pnc/Tk/Cnn	157	204	89 9 3
13	Winoka//Jaral 66/Winter	157	204	85 9 4
11	SS/D8/Wmt/4/Hume/3/SS/12500/RCh/Pn//Cnn	159	208	81 9 1
12	"	160	209	84 9 3
9	"	161	209	83 9 1
5	Cnn//Pnc/3/Tk/Cnn/4/Scout	159	204	85 9 1
15	Yg*3/Cnn Sel. 2-3-13-6	155	204	89 9 3
1	Kharkof	161	207	95 9 2
16	Nb176/Y18181//YTO 117, Sel. 1-1-4-3	163	205	99 9 4
		163	207	97 9 3

Table 2. (concluded)

Entry no. :	C. I. or Sel. No.	: Leaf Rust :		: Rust Stem Rust :		: Leaf Disease :		: Shattering :		: Vigor :		: Bacteria :		: Spot :		: Yield :		: Volume :	
		: : : : : %	: : : : : %	: : : : : %	: : : : : %	: : : : : %	: : : : : %	: : : : : %	: : : : : %	: : : : : %	: : : : : %	: : : : : %	: : : : : %	: : : : : %	: : : : : %	: : : : : %	: : : : : %	: : : : : %	: : : : : %
Number of trials		0-9	1	5	4	4	4	3	2	0-9	0-9	0-9	2	1	1	1	1	12	15
14	CO701733	0	0	25	M	0	VR	40	8	7	7	40	5	5	2.67	34	78.1	2910	
2	13190	0	0	52	S	12	MS	20	7	8	8	20	T	T	2.67	34	78.5	2833	
6	NE69442	0	0	44	S	0	VR	20	8	7	7	20	5	5	2.67	44	77.7	2790	
8	NE70712	0	0	51	S	0	VR	75	9	6	6	75	40	40	2.67	40	77.2	2699	
4	NE701132	0	0	2	M	1	MR	35	8	7	7	35	5	5	2.00	36	77.6	2674	
10	SD72172	0	0	26	M	0	VR	15	8	5	5	15	2	2	2.83	31	78.0	2656	
7	NE70711	0	0	57	S	1	VR	70	9	6	6	70	50	50	2.67	38	76.8	2652	
3	NE70577	0	0	61	S	1	VR	40	9	8	8	40	50	50	3.00	42	77.6	2630	
13	SD7143	0	0	2	MR	0	VR	45	8	6	6	45	10	10	2.33	33	76.2	2598	
11	SD72175	0	0	16	M	0	VR	40	8	6	6	40	5	5	2.67	32	77.3	2593	
12	SD72193	0	0	39	M	1	VR	30	7	5	5	30	2	2	2.33	32	78.3	2580	
9	SD72134	0	0	15	M	0	VR	55	8	5	5	55	10	10	3.17	32	79.3	2538	
5	NE68521	0	0	53	S	0	VR	40	9	8	8	40	10	10	2.83	41	77.8	2437	
15	MT6715	0	0	65	S	24	M	40	9	7	7	40	20	20	3.00	31	77.5	2399	
1	1442	0	0	57	S	29	S	25	8	6	6	25	T	T	3.17	35	76.7	2326	
16	MT6930	0	0	57	S	30	M	35	8	6	6	35	30	30	3.33	33	76.9	2253	

Table 3.- Summary of agronomic data for varieties grown in the Northern Regional Performance Nursery in 1974.

Variety	C. I. or Sel. No.	Days to Head	Ripe	Plant: Height	Winter: Survival	Lodg- ing	Shat- ting	Leaf Rust	
								Sev.	Resp.
Number of trials		16	2	cm	0-9	0-9	0-9	%	
Buckskin									
Sage	C117263	166	201	87	8	2	3	75	S
SS/D8//Amt/4/Hume/3/SS/12500/RCh/Pn//Cnn	KS70H179	166	201	84	9	2	2	4	MS
Cloud	SD72193	169	201	77	9	1	1	40	MS
SS/D8//Amt/4/Hume/3/SS/12500/RCh/Pn//Cnn	KS7016	166	201	86	9	2	3	7	S
Homestead	SD72129	166	201	79	9	2	1	37	N
SS/D8//Amt/4/Hume/3/SS/12500/RCh/Pn//Cnn	C117264	165	201	75	8	1	2	69	S
"	SD72172	167	201	71	9	1	1	26	M
Sentinel	SD72126	169	201	81	9	1	1	35	M
Warrior/Scout	C117265	166	201	78	8	1	2	57	MS
SS/D8//Amt/4/Hume/3/SS/12500/RCh/Pn//Cnn	NE70711	166	201	86	9	2	2	68	S
Warrior/Scout	SD72175	168	201	77	9	1	1	9	M
Pnc/3*Cnn/3/Ky58/Nth/2/2*Cnn/Tm/Mi/Hope/4/Sut	NE70712	166	201	85	9	2	2	66	S
Agate	NE69441	167	201	84	9	2	1	63	S
Warrior	NE69442	168	201	84	9	2	1	51	S
SS/D8//Amt/4/Hume/3/SS/12500/RCh/Pn//Cnn	C113190	168	201	86	9	2	3	56	S
Hume/Nebr. Semidwarf Comp.	SD72134	167	201	77	9	1	1	25	MS
SS/D8//Amt/3/Mrr/III-54-12	SD697	166	201	87	9	1	2	47	MS
NB 176/Y18181/YTO 117, Sel. 1-1-4-3	SD72227	168	201	77	9	1	1	25	MS
Yg*3/Cnn, Sel. 2-3-13-6	MT6930	171	201	94	9	2	2	75	S
BWH 1376-8/YTO 117, Sel. 1-3-2-1	MT6715	169	201	92	9	1	3	73	S
Kharkov	MT6916	171	201	98	9	2	3	71	S
	CI 1442	170	201	94	9	2	2	60	S

Table 3. Concluded.

C. I. or Sel. No.	Stem Rust : Sev. : %	Septoria : tritici : 0-9	Straw : Strength : 1-6	Volume : Weight : kg/hl	Yield kg/ha
No. of trials	4	3	1	18	16
CI17263	1	VR	3	76.7	2699
KS70H179	0	0	2	78.0	2596
SD72193	0	0	3	73.6 ^{1/}	2513
KS7016	0	0	2	77.7	2510
SD72129	36	S	3	77.0	2487
CI17264	0	0	3	77.0	2486
SD72172	15	M	3	76.5	2454
SD72126	0	0	2	78.5	2434
CI17265	0	0	5	75.4	2427
NE70711	4	R	4	76.7	2404
SD72175	1	R	3	76.6	2374
NE70712	7	MR	3	76.6	2365
NE69441	0	0	3	77.2	2363
NE69442	0	VR	4	77.7	2355
CI13190	34	M	3	76.4	2353
SD72134	1	VR	2	78.5	2302
SD697	0	VR	4	76.7	2246
SD72227	0	0	3	75.5	2212
MT6930	23	S	6	76.8	2061
MT6715	38	S	5	76.9 ^{1/}	1971
MT6916	50	S	6	77.3	1913
CI 1442	54	S	3	75.7	1897

^{1/} Average based on one less trial than the number shown.

Table 4. Seedling reaction of the 1973 Northern Regional Hard Red Winter Wheat Performance Nursery to *Puccinia graminis tritici*.
(by D. V. McVey, Cereal Rust Laboratory, ARS, University of Minnesota, St. Paul, MN)

Reaction Produced by Isolates																
Entry No.	Variety or Sel. No.	C.I. No.	Source	TM*	TN	QL	QS	QT	RP	RT	RK	RH	MB	HF	HN	GJ
1.	Kharkof	1442	check	15	15B-2		151			11-32			56	17		?
2.	Warrior	13190	check	S	S	R	I	S	S	S	S	S	S	I	S	S
3.	HiPlains	17262	Nebraska	S	I	R	R	S	R	R	R	R	S	R	R	R
4.	NE 69441	-	"	S	R	R	R	R	R	R	R	R	S	R	R	R
5.	Agate	-	"	S	R	R	R	R	R	R	R	R	S	R	R	R
6.	NE 701134	-	"	S	R	R	R	R	R	R	R	R	S	R	R	R
7.	NE 70711	-	"	S	R	R	R	R	R	R	R	R	S	R	R	R
8.	NE 70712	-	"	S	R	R	R	R	R	R	R	R	S	R	R	R
9.	Bronze	14013	S. Dakota	S	S	R	I	S	S	S	S	S	S	I	S	S
10.	SD 7117	-	"	S	R	R	R	R	R	R	R	R	S	R	R	R
11.	SD 697	-	"	S	R	R	R	R	R	R	R	R	S	R	R	R
12.	68F6635	-	Nebraska	S	R	R	R	R	R	R	R	R	S	R	R	R
13.	SD 62103	-	S. Dakota	S	R	R	R	R	R	R	R	R	S	R	R	R
14.				S	R	R	R	R	R	R	R	R	S	R	R	R
15.				S	R	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R	R	R
				S	S	R	R	R	R	R	R	R	S	R		

* Cereal Rust Laboratory designation based upon 8 isogenic lines.

7700093

Table 5. Seedling Reaction of the 1974 Northern Regional Hard Red Winter Wheat Performance Nursery to *Puccinia graminis* f. sp. *tritici*. (by D. V. McVey, Cereal Rust Laboratory, ARS, University of Minnesota, St. Paul, MN)

Entry No.	Variety or Cross	C.I. or Sel. No.	Source	Reaction Produced by Isolates											
				MCB* 56	HFC 17	HJC 17	TBM 15	TLM 15	TNM 15B-2	RPL 11-32-113	RTQ 11-32-113	RHR 11-32-113	RKQ 11-32-113	QSH 11-32-113	QTH 11-32-113
1	Kharkof	CI 1442	check	S	R	R	S	S	S	R	R	S	R	I	I
2	Warrior	CI 13190	check	S	S	S	S	S	S	S	S	S	S	I	I
3	Pnc/3* <i>Cnn</i> /3/Ky58/Nth/2/2*														
4	Agate	NE69441	Nebraska	R	R	R	R	R	R	R	R	R	R	R	R
5	Warrior/Scout	NE69442	"	R	R	R	R	R	R	R	R	R	R	R	R
6	do.	NE70711	"	S	S	S	S	S	S	S	S	S	S	S	S
7	Hume/Nebr. Semidwarf Comp.	NE70712	"	S	S	S	S	S	S	S	S	S	S	S	S
8	SS/D8//Wnt/4/Hume/3/SS/	SD697	So. Dak.	S	R	R	R	R	R	R	R	R	R	R	R
9	12500/Rch/Pn//Cnn	SD7216	"	R	R	R	R	R	R	R	R	R	R	R	R
10	do.	SD7219	"	R	R	R	R	R	R	R	R	R	R	R	R
11	do.	SD72134	"	R	R	R	R	R	R	R	R	R	R	R	R
12	do.	SD72172	"	R	R	R	R	R	R	R	R	R	R	R	R
13	do.	SD72175	"	R	R	R	R	R	R	R	R	R	R	R	R
14	SS/D8/Wnt/3/Lcr/III-54-12	SD72193	"	R	R	R	R	R	R	R	R	R	R	R	R
15	Yg*3/Cnn Sel. 2-3-13-6	SD7227	"	R	R	R	R	R	R	R	R	R	R	R	R
16	BWH 1376-8/YTO 117, Sel.	MT6715	Montana	S	S	S	S	S	S	S	S	S	S	S	S
17	1-3-2-1	MT6916	"	S	R,S	S	S	S	S	S	S	S	S	S	S
18	Nb176/Y18181//YTO 117,	MT6930	"	S	S,R	S	S	S	S	S	S	S	S	S	S
19	Sel. 1-1-4-3	CI 17264	Nebraska	R	R	R	R	R	R	R	R	R	R	R	R
20	Homestead	CI 17265	"	R	R	R	R	R	R	R	R	R	R	R	R
21	Sentinel	CI 17263	"	S	R,S	R	R	R	R	R	R	R	R	R	R
22	Buckskin	KS70H179	Kansas	R	R	R	R	R	R	R	R	R	R	R	R
	Sage	KS7016	"	R	R	R	R	R	R	R	R	R	R	R	R
	Cloud														

* Cereal Rust Laboratory designation based upon 12 isogenic lines.

77000033

Table 6. Chemical, Milling, and Baking Data for the Northern Regional Performance Nursery Composites of Hard Winter Wheat Varieties Harvested in New Mexico, Nebraska, South Dakota, Minnesota, North Dakota, Wyoming, Montana, and Idaho in 1975. 1/

Variety	C.I. or Sel. No.	Wheat 2/					Bread-baking Data 2/				
		Wt. Per Bu. lbs.	Ash %	Pro- tein %	Flour Yield %	Ab- sorp- tion %	Mixing Time 3/			Loaf Volume	
							As Rec'd	Cor- rect- ed To	Crumb To Grain	As Rec'd	Cor- rect- ed To
							min.	min.		cc.	cc.
								12.0% P			12.0% P
Kharkof	1442	60.1	1.60	13.0	74.7	.44	2 1/2 Q	-	S	923	916
Warrior	13190	61.3	1.55	12.8	76.0	.43	4	3 7/8	S	939	954
Lancota	17389	60.8	1.60	14.0	74.2	.44	3	-	S	1051	976
Cnn/2/Pnc/3/Tk/Cnn/4/Sut	NE68521	60.7	1.62	13.7	74.3	.42	4 3/8	-	S	942	896
Agate	NE69442	61.5	1.57	13.1	74.5	.40	4 1/8	-	S	955	934 5/
Atl 66/Cnn/2/Cnn/Pnc/ Tk/Cnn	NE70577	61.0	1.56	12.8	75.0	.41	4	-	S	948	948 5/
Warrior/Scout	NE70711	60.5	1.56	12.7	74.3	.40	7 1/8	7 Q	S	1012	1020
"	NE70712	60.4	1.57	12.8	73.5	.41	4 7/8	4 2/7	S	958	973 5/
II21031/Tp/2/C0652363	CO701733	60.6	1.58	12.3	72.8	.42	6 3/4	6 3/8 Q	S	916	952
Winoka/2/Jaral 66/Hnt	SD71143	59.8	1.60	13.5	73.1	.42	3 1/2 Q-S	-	S	977	948
SS/D8/Hnt/4/Hume/3/											
SS/12500/RCh/Pn/2/Cnn	SD72134	62.2	1.61	12.9	72.4 4/	.37	4 5/8	-	S	976	969 5/
"	SD72172	61.0	1.57	12.5	72.8 4/	.41	5 1/8	4 3/4	S	958	1005 5/
"											
"	SD72175	60.5	1.61	13.3	73.9 4/	.40	5 3/8	-	S	986	971 5/
"	SD72193	62.3	1.56	13.2	71.4 4/	.42	4 7/8	-	S	1048	1024 6/
Yg 3/Cnn Sel. 2-3-13-6	MT6715	60.6	1.58	12.8	70.6	.40	4	3 7/8	S	969	984 5/
Nb 176/Y 18181/2/											
YTO-117, Sel. 1-1-4-3	MT6930	60.3	1.61	13.4	71.9	.42	4 7/8	-	S	1034	988 6/

7700093

Table 6 (cont.)

- 1/ Chemical data expressed on a 14% moisture basis.
- 2/ S, Q, and U - Satisfactory, questionable, and unsatisfactory quality with respect to property in question. A satisfactory rating is inferred in the absence of a designated one. One unsatisfactory rating, in general, characterizes a variety as undesirable for hard wheat milling and breadmaking purposes. Crumb colors were satisfactory for all entries.
- 3/ Mixing time used in baking is evaluated in conjunction with other mixing properties obtained from the 10-g. mixogram.
- 4/ Softer than average hard wheat milling properties but entirely satisfactory.
- 5/ Promising overall quality characteristics.
- 6/ Particularly promising overall quality characteristics.

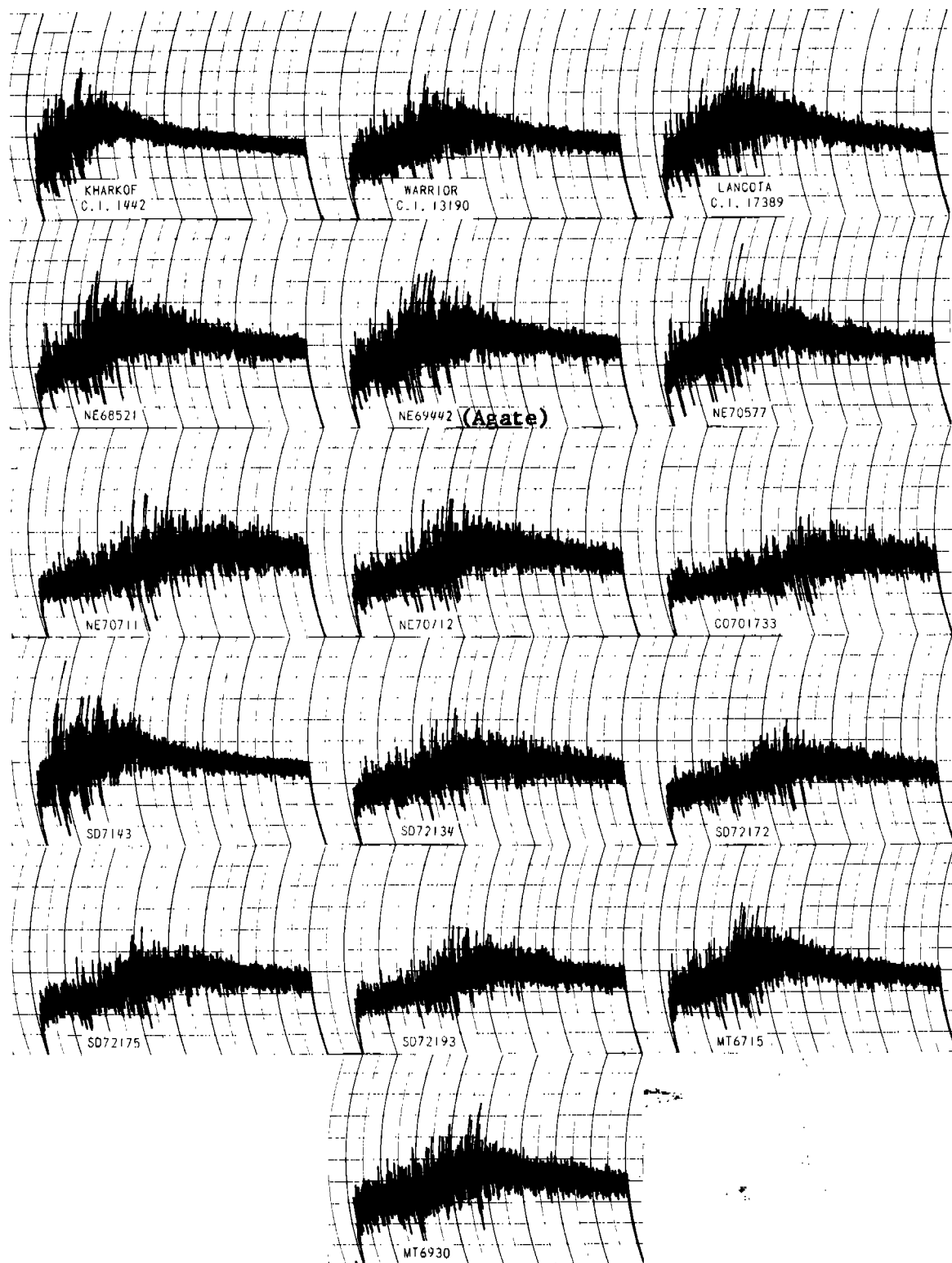


Fig. 1. Mixograms (10-g.) for the Northern Regional Performance Nursery composites of hard winter wheat varieties harvested in New Mexico, Nebraska, South Dakota, Minnesota, North Dakota, Wyoming, Montana, and Idaho in 1975. Mixing time is the time (min.) to the peak. Mixing tolerance is the slope and width after the peak and stability of mixogram height on either side of the peak. Major arcs are at 1-minute intervals.



UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL MARKETING SERVICE

Grain and Seed Division
National Agricultural Library
Beltsville, Maryland 20705

January 30, 1978

PLANT VARIETY PROTECTION OFFICE

Gentlemen:

Subject: Application No. 7700093
Variety and Kind - Wheat, 'Agate'

As provided in section 83(a) of the Plant Variety Protection Act, 7 U.S.C. 2321, we request that the Certificate on the above variety be issued with a notation on each Certificate that the right to exclude others from selling, offering for sale, reproducing, importing or exporting the variety covered by this Certificate, or using it in producing a hybrid or different variety is waived.

It has been agreed that the certificate should be issued in the name(s) of:

Nebraska Agricultural Experiment Station

February 6, 1978
(Date)

Howard W. Ottoson
(Signature)
Howard W. Ottoson, Dean and Director, NAES

February 7, 1978
(Date)

M. A. Massengale
M. A. Massengale, Vice Chancellor for
Agriculture and Natural Resources

For the Board of Regents -
University of Nebraska

2/7/78
(Date)

Miles Tommeraasen
Miles Tommeraasen, Vice Chancellor for
Business and Finance

11. HEAD:

☐ 1 Density: 1 = LAX 2 = DENSE☐ 4 Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE
4 = OTHER (Specify) oblong to tapering☐ 4 Awedness: 1 = AWNLESS 2 = APICALLY AWNLETED 3 = AWNLETED 4 = AWNED☐ 1 Color at maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED
5 = BROWN 6 = BLACK 7 = OTHER (Specify): _____☐ 0 ☐ 9 CM. LENGTH See attachment, Table 6 ☐ 0 ☐ 9 MM. WIDTH

12. GLUMES AT MATURITY:

☐ 2 Length: 1 = SHORT (CA. 7 mm.) 2 = MEDIUM (CA. 8 mm.)
3 = LONG (CA. 9 mm.)☐ 2 Width: 1 = NARROW (CA. 3 mm.) 2 = MEDIUM (CA. 3.5 mm.)
3 = WIDE (CA. 4 mm.)☐ 1 1 = glabrous 2 = pubescent☐ 4 Shoulder: 1 = WANTING 2 = OBLIQUE 3 = ROUNDED
shape: 4 = SQUARE 5 = ELEVATED 6 = APICULATE☐ 3 Beak: 1 = OBTUSE 2 = ACUTE 3 = ACUMINATE

13. COLEOPTILE COLOR:

☐ 1 1 = WHITE 2 = RED 3 = PURPLE

14. SEEDLING ANTHOCYANIN:

☐ 1 1 = ABSENT 2 = PRESENT

15. JUVENILE PLANT GROWTH HABIT:

☐ 1 1 = PROSTRATE 2 = SEMI-ERECT 3 = ERECT

16. SEED:

☐ 3 Shape: 1 = OVATE 2 = OVAL 3 = ELLIPTICAL☐ 1 Cheek: 1 = ROUNDED 2 = ANGULAR☐ 1 Brush: 1 = SHORT 2 = MEDIUM 3 = LONG☐ 1 Brush: 1 = NOT COLLARED 2 = COLLARED☐ 5 Phenol reaction 1 = IVORY 2 = FAWN 3 = LT. BROWN
(See instructions): 4 = BROWN 5 = BLACK☐ 2 Embryo size: 1 = small 2 = medium
3 = large☐ 3 Color: 1 = WHITE 2 = AMBER 3 = RED 4 = PURPLE 5 = OTHER (Specify) _____☐ 0 ☐ 7 MM. LENGTH ☐ 0 ☐ 3 MM. WIDTH ☐ 3 ☐ 1 GM. PER 100 SEEDS17. SEED CREASE: ☐ 4 = v. similar to Scout 66 (narrow) ☐ 4 = v. similar to Scout 66 (shallow to mid-deep)
☐ 4 Width: 1 = 60% OR LESS OF KERNEL 'WINOKA'
2 = 80% OR LESS OF KERNEL 'CHRIS'
3 = NEARLY AS WIDE AS KERNEL 'LEMHI'☐ 4 Depth: 1 = 20% OR LESS OF KERNEL 'SCOUT'
2 = 35% OR LESS OF KERNEL 'CHRIS'
3 = 50% OR LESS OF KERNEL 'LEMHI'

18. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

☐ 2 STEM RUST (Races) currently prevalent ☐ 1 LEAF RUST (Races) prevalent
races. races.
☐ 0 POWDERY MILDEW ☐ 0 BUNT☐ 0 STRIPE RUST (Races) ☐ 0 LOOSE SMUT
☐ OTHER (Specify) _____

19. INSECT: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

☐ 0 SAWFLY ☐ 0 APHID (Bydv.) ☐ GREEN BUG ☐ CEREAL LEAF BEETLE
☐ OTHER (Specify) _____ HESSIAN FLY } Mod. res. GP ☐ A ☐ B ☐ C
RACES: ☐ D ☐ E ☐ F ☐ G

20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	Scout 66	Seed size	Scout 66
Leaf size	Scout 66	Seed shape	Scout 66
Leaf color	Scout 66	Coleoptile elongation	Scout 66
Leaf carriage	Scout 66	Seedling pigmentation	Scout 66

INSTRUCTIONS

GENERAL: The following publications may be used as a reference aid for the standardization of terms and procedures for completing this form:

- (a) L.W. Briggie and L. P. Reitz, 1963, Classification of Triticum Species and Wheat Varieties Grown in the United States, Technical Bulletin 1278, United States Department of Agriculture.
- (b) W.E. Walls, 1965, A Standardized Phenol Method for Testing Wheat Seeds for Varietal Purity, contribution No. 28 to the handbook of seed testing prepared by the Association of Official Seed Analysts. (See attachment.)

LEAF COLOR: Nickerson's or any recognized color fan should be used to determine the leaf color of the described variety.